



SCENE FROM THE 60's? — Well, no. It's called NUWAX-79 and it's a DOE/DoD exercise designed to provide an opportunity for emergency teams to respond to a simulated aircraft accident involving nuclear weapons. NUWAX-79 was conducted at the Nevada Test Site, and all participants — including the "protestors" in the photo — are acting the role. Rod Geer of Public Information Division 3161 is shown in his role as newsman interviewing the Army's spokesman. Other Sandians who worked with the emergency teams at the simulated crash site include Don Lewis (1231), Frank Murar and Jack Martinell, (both 8322).

LAB NEWS

VOL. 31, NO. 9

MAY 4, 1979

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA

Cheaper Solar Cells May Be At Hand

Experiments by two Sandia scientists indicate it may be possible to greatly enhance the efficiency of polycrystalline silicon solar cells.

These multi-crystal cells, which show promise in terms of being inexpensive to fabricate, are at present inefficient in converting sunlight to electricity and thus have attracted less interest than the more efficient but more expensive single-crystal photovoltaic cells.

The polycrystalline silicon cells typically convert only five percent, or less, of sunlight to electricity, compared to about triple this amount for the most efficient single-crystal cells.

Recent experiments by Sandia researchers Carl Seager (5132) and David Ginley (5154) indicate that the efficiency of the polycrystalline cells can be raised substantially — perhaps even doubled.

Given the greater simplicity of producing thin films of polycrystalline silicon by chemical vapor deposition and other mass production techniques, this improvement could mean that such cells might ultimately become competitive with single-crystal cells.

Single-crystal cells must be grown, using processes that appear unlikely to be as simple

or as low-cost as those for forming thin polycrystalline films.

Solar cells, first used as reliable, lightweight, long-lived sources of power for space satellites, are made of semiconductor materials which absorb light particles (photons), thereby generating electrically charged particles that carry electric current in the semiconductor.

The cost of these cells has prevented their widespread application, although their potential as simple, non-polluting energy sources has led to considerable research in the nation's laboratories.

The Sandia experiments involve treating the boundaries between the microscopic grains or crystals in the silicon films so that current carriers are less likely to be "trapped" as they pass through the material.

The low efficiency of polycrystalline silicon cells has long been attributed to the electrical forces, located along the grain boundaries, that attract the carriers, with the result that few ultimately escape to contribute to cell current.

By diffusing atoms of hydrogen into the grain boundaries, Seager and Ginley have determined that chemical changes occur which permit a great many more of the carriers to pass successfully across such boundaries, thus

increasing cell current.

Because grain boundary conditions are extremely complex and observable only on a microscopic level, the two researchers are not at present able to explain precisely how the hydrogen atoms affect the grain boundaries.

However, the major effect of the hydrogen seems to be either to tie up unattached chemical bonds produced by a mismatch of silicon grains or to replace the silicon-oxygen bonds which may be present at grain boundaries.

Regardless of the exact mechanism, boundary modification can be achieved fairly easily — in a moderate vacuum at temperatures of 200 to 400°C for periods of a few hours or less — so that the process could be economical on a commercial scale. The modified boundaries also remain stable over a wide range of temperatures.

The current experiments involve placing the silicon — either bulk or thin film — within a hydrogen-filled vacuum tube, and exciting the hydrogen to an ionized state, or plasma. At this point, the hydrogen atoms begin diffusing into the grain boundaries.

Future work calls for optimizing the passivation technique, with the goal of eventual practical application to inexpensive, thin-film silicon cells.

Gene Zucuski Devises 'Automatic Hook'

Gene Zucuskie (2323) has devised a simple but effective "automatic hook" with a unique application in the nuclear weapons program.

The device with its two moving parts works while suspended at the end of a single cable on a crane or from any winch-and-boom equipped vehicle.

The container to be hoisted is fitted with a shaft and ball at its top. The hook mechanism consists of a guide ring, hollow cone and a two-part chamber with pivoting levers. The dimensions of the shaft and ball on the one hand, and the guide ring and cone on the other, insure that the guide ring and cone "find" the ball and guide it into the insertion chamber. Here one lever is shaped to guide further the ball into the capture socket, then this lever falls clear. After insertion, the ball cannot be released until there is slack in the cable. Release is then immediate. Within the chamber, the weight of the resting cone pushes the ball up past a second lever so shaped as to expel the ball through the original opening in the cone. The entire operation is controlled by the crane operator.

The automatic hook was developed to fill a need that arose from one concept for nuclear weapons storage in deep vertical underground shafts. Any number of containers could be stacked inside the shaft. Still, without hydraulic, magnetic or electronic gripping and release devices, and possibly a remote TV camera, insertion and retrieval could be difficult. The automatic hook with its simplicity eliminates these expensive complications.

In another application, in the Safeguards program, the vertical underground storage concept is translated into a floor safe. A massive door protects the contents of a deep cylindrical vault. Contents of the vault are inserted and retrieved by using the automatic hook.

"There are other possible applications of the automatic hook," Gene says. "It could be used to handle containers of nuclear waste in underground storage, in well drilling operations for insertion and retrieval of special instrumentation packages or explosives, and in



GENE ZUCUSKI (2323) displays a model of his "automatic hook." Hanging on the end of a single cable operating from a crane, the hook captures and releases ball-and-shaft-equipped containers simply and effectively. In plexiglass chamber above the guide ring, the capture and release levers are visible, the only moving parts within the device.

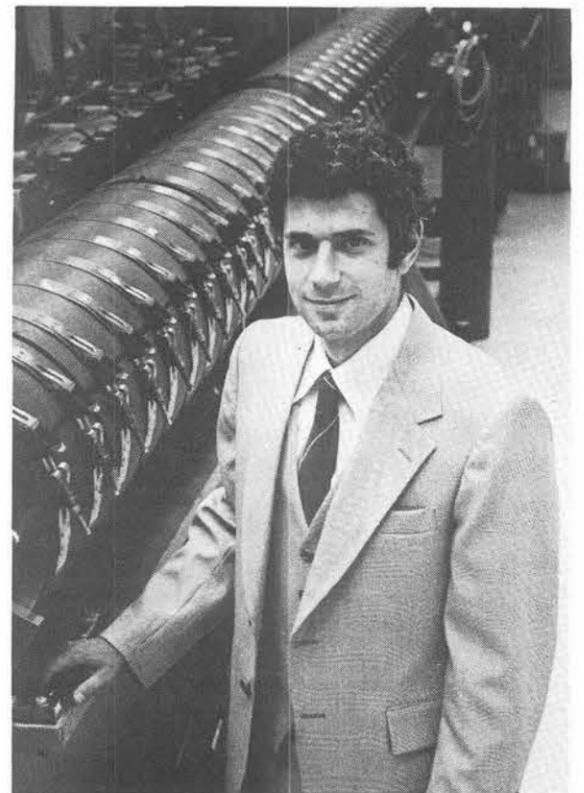
coal gasification or *in situ* oil shale retorting experiments. And it could see use in heavy construction for hoisting and release of buckets of concrete or packages of materials."

Gene came up with the original idea for the automatic hook. Designer/draftsman Bill Zagar (2458) modified and improved the design.

Supervisory Appointment

RICHARD PALMER to supervisor of Laser and Plasma Physics Research Division 4234, effective May 1. Richard has worked with the Laser Physics Research department since joining the Labs in July 1971. His work included research relating to laser fusion and, for the last few years, development of an atomic iodine laser. In addition to laser and plasma physics research, Richard's new division is working on PULSAR, a program to develop very high magnetic fields and high currents for pulsed power generation.

Richard earned a bachelor's degree from MIT in physics and, in 1971, received his PhD from Princeton, also in physics. He is a member of the American Physical Society. Off the job he enjoys tennis, softball and hiking. He and his wife Kei and their son Tod live in the NE heights.



RICHARD PALMER (4234)

Solar Materials Handbook Discusses Hazards

A handbook on the hazardous properties and environmental effects of materials used in solar heating and cooling technologies is being prepared by Sandia Laboratories. Sponsored by DOE's Environmental Control Technology Division, an interim version of the handbook is being released to solar system designers and representatives of solar energy industries.

"The purpose of the handbook is to smooth the way for rapid solar energy development," says Editor Jimmie Searcy (4533). The handbook, intended for use by homeowners, designers, architects, technologists, and builders, begins with explanations of passive and active solar systems. It then describes the various components of a system — heat transfer fluids and fluid treatment chemicals, insulation materials, seals and sealant materials, glazing materials, collector materials, and storage media — and lists the different substances which can be used for each component. For instance, common insulators are glass and mineral wools, and plastic foams.

The last chapters detail toxic properties and other potential health effects, environmental effects, and fire-related properties of solar materials. Most environmental hazards

that designers and users have control over result from improper disposal of these materials. For example, glycols (ethylene and propylene glycol) are the most commonly used liquid heat transfer fluids. They are biodegradable and, in limited quantities, may be disposed of through sewer systems. But, if glycol is used in many solar systems located in a relatively small area, sewer disposal may not be acceptable.

A major concern discussed in the handbook involves liquid heat transfer fluids used in solar hot water heaters. In such systems, with a heat exchanger often immersed in potable water, the leakage of toxic fluids into the hot water reservoir is a possibility. Such systems thus need to take special precautions.

Fire hazards are also possible with collectors, the handbook points out. If wood is used as a structural material in a collector, it should be well insulated from the hot components. Wood slowly degrades when exposed to higher temperatures, and its flash-ignition temperature drops as it degrades. Flash-ignition temperatures as low as 100° C have been observed for thermally aged wood in some experiments.

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Chemical Heat Pumps Complement Solar Energy

A heat pump powered by solar energy rather than by electricity appears to be a step or two closer to commercial use. That's the current news from the TEST (Thermochemical Energy Storage and Transport) program managed by Sandia's Taz Bramlette (8451) for DOE (LAB NEWS, July 15, 1977).

Such a heat pump is called a chemical heat pump. But let's first look at conventional heat pumps — they're simply air conditioners that can run in either direction. In summer, for example, heat is removed from the inside of a building and pumped outside. In winter, the heat pump takes heat from the outside (even winter air contains some heat) and pumps it inside. Electrical heat pumps for space heating and air conditioning are now commercially available.

A chemical heat pump performs all the functions of the conventional electric pump by harnessing the energy (or heat) released during a reversible chemical reaction. That is, a chemical reaction driven in one direction by the application of heat, such as solar, can later be driven in the opposite direction to give up an almost equal amount of heat in the process. Hence the chemical heat pump's promise of lowering two of solar heating's major barriers — storing energy for nights, or cloudy days, or even winters; and reducing the surface area of collectors, which are the greatest cost associated with a solar energy system, by perhaps 30 to 70 percent.

Chemical heat pump theory is currently becoming practice. Four contractors, under the direction of Carl Hiller (8453), are experimenting with methanolated salts (EIC), ammoniated salts (Martin Marietta), hydrides (Argonne National Lab), and sulfuric acid (Rocket Research). In addition, an earlier contract produced some good results with hydrated salts.

It's the sulfuric acid system that currently is closest to reality. That is, a prototype is providing data on heating and cooling efficiencies which would be applicable to a 900 m² (10,000 sq. ft.) building. When heat, such as that collected in a solar energy system, is applied to a tank of sulfuric acid diluted with water, it begins to boil and drives off water vapor through a duct into a second tank where it condenses. (This heat of condensation may be used for heating or it may simply be discharged into the atmosphere.) This is the charging phase.

Heat pumping occurs during the discharge phase. Once the acid is no longer being heated, its vapor pressure lowers enough

Retiring



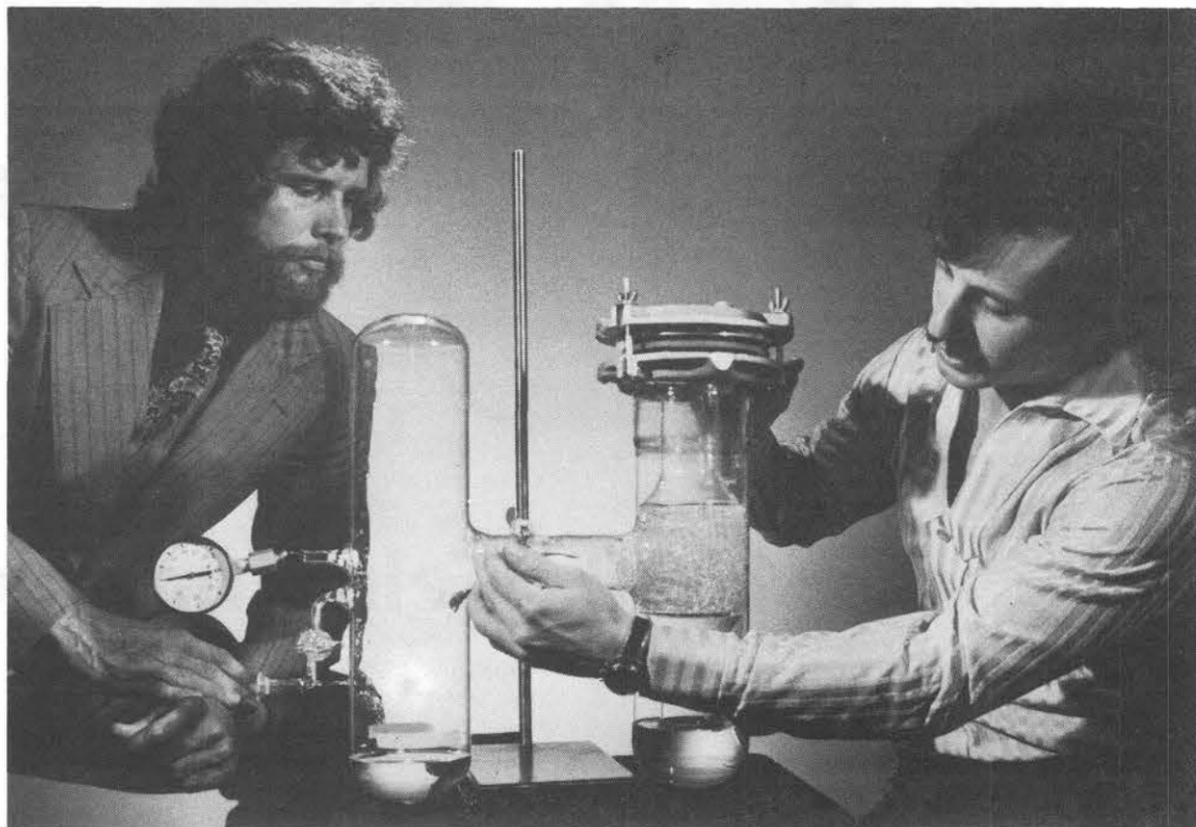
Grace Campbell (8264)

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CHEMICAL HEAT PUMP holds the attention of Taz Bramlette (left, 8451) and Carl Hiller (8453). This working model contains sulfuric acid in right hand column, water in left. Allowing them to recombine produces heat.

to return the water as vapor. Then, when heat is needed, the water vapor flows back into the acid tank. The vaporization of the water removes heat from the water tank's surroundings and deposits it in the acid tank along with the heat generated by the dilution process itself, in a process familiar to chemistry students.

It's the difference in chemical potential of the acid and the water that makes possible this flow of heat from a low temperature area to a higher temperature area, thus allowing the system to provide either heating or cooling. No compressor is required.

Of course, there are problems. One is that most people aren't ready for sulfuric acid in or near their homes — though they think nothing of driving on the highway next to a battery containing a gallon or so of it.

But the next steps toward commercialization of the chemical heat pumps will likely include their installation in small plants whose employees are used to the handling of chemicals — much as most of us handle electricity, natural gas, and gasoline on

a day-by-day basis. Experience gained here will help define controls and safety measures applicable to residential situations where minimum maintenance and adjustment are desired.

Other types of systems have their problems too. For example, those involving a solid (such as calcium chloride) may be safer, but heat transfer capabilities go down; that means larger and more expensive units. And "bed stability" can be a problem — a solid bed system is likely to swell by 40 percent the first time it's charged with heat, by 20 percent on later chargings.

"At this point," says Bill Wilson, supervisor of Solar Components Division 8451, "we — Sandia and its contractors — are demonstrating the feasibility of the technology, but we're still in the experimental stage, not ready for a turn-key demonstration project yet. In the near future, however, other DOE groups are likely to be called in to organize a program to show that chemical heat pumps can become commercially attractive."

Sympathy

To Bob Schultz (8412) on the death of his father in Livermore, April 8.

Congratulations

Mr. and Mrs. Larry Kirkbride (8423), a daughter, Kellye Colleen, April 7.

Authors

Jack Dini and Rudy Johnson (both 8312), "The Influence of Nickel Sulfanate Operating Parameters on the Impurity Content and Properties of Electrodeposits," THIN SOLID FILMS, Vol. 54, p. 183.

Jack Dini, Rudy Johnson and John Brooks (8316), "Zinc in Sulfanate Nickel Deposits, Influence on Weldability of Electroforms," METAL FINISHING, Vol. 77, p. 99.

Take Note

Sandians who participate in LEAP — the Livermore Employees Assistance Plan — were among those recognized recently by Hotline, a local service agency supported by SLL employees. An award, reading "To Sandia LEAP Contributors for Thoughtful Sharing," was presented during Hotline's annual meeting held at the Century House in Pleasanton. Hotline responds to Livermore Valley community needs by providing crisis help via a 24-hour telephone line (828-HELP); drug and alcohol counseling; and community services by Spanish-speaking staffers. The award, accepted by LEAP committee member Lorena Schneider (8265), is displayed in Bldg. 911 lobby.



READY FOR ANYTHING, ANYWHERE. Carter Broyles, Director of Field Engineering 1100 (at center with hand on snowmobile windshield) is shown here with some special vehicles used by Mobile and Remote Ranges Division 1127 in support of development tests anywhere in the world. Harry Warrick and Cal Cox perch on the fenders of a dune buggy used at locations like Wendover Flats and Northrup Strip at White Sands. Ed Stout and Dean Kuehl sit astride a snowmobile that's seen service three times on the Arctic Icecap. Gordo Miller, at far right, heads Division 1127. Other vehicles include a coring rig (behind Harry and Cal), a GI wrecker and a fuel tanker converted to water that's used both as a firetruck and a source of supply for drill rigs.

The Directorates

1100: Field Engineering

Paradoxically, Sandia's weapon components and systems are exposed in tunnels deep underground to the kind of radiation they would encounter if exposed to a nuclear detonation in the upper atmosphere. And underground experiments are an absolute must in Sandia's in-situ oil shale retort program as well as in experiments relating to in-situ coal gasification and the saltmine storage of nuclear waste.

The problem of making measurements and recording data underground is complex in and of itself. When it's complicated by heat, blast, pressure and radiation, it becomes even more so. Under these conditions, designing and emplacing instruments, measuring and recording outputs, requires special expertise. Field Engineering Directorate 1100 supplies that expertise.

"We were originally known as the Underground Experimentation Effects Directorate," 1100 Director Carter Broyles (who has been part of the organization since

its inception) explains, "but with the winding down of the weapon test program in the early seventies, our mission was expanded to include support of simulation work in Area V and the waste management and fossil energy programs. Last year, Tonopah Test Range and the Mobile and Remote Ranges Division became a part of 1100."

About half of 1100's work continues to be in support of the Full Scale Test Program, a major part of which is determining the effects of radiation on Sandia systems and components. If the Comprehensive Test Ban Treaty became a reality, the effort would increase in simulation — finding ways to better simulate the kind of radiation produced in nuclear detonations.

"We've got 16 people in Area V working on simulation, both designing instrumentation and actually taking data," Carter told us. "We're supporting experiments on Hermes, REBA, REHYD, RIPPLE, MITE, ACRR and SPR II/III to expose components and

weapon systems to radiation and to improve our ability to simulate full scale events.

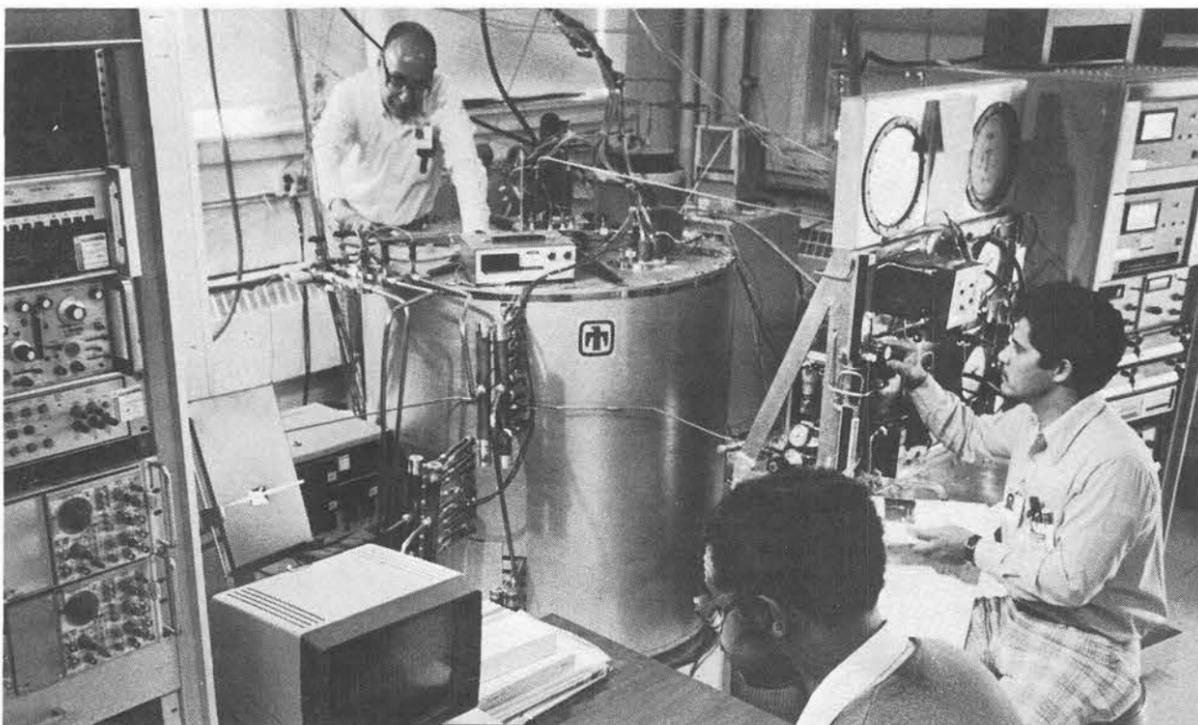
"We're also improving our data-gathering system at the Nevada Test Site," Carter says, "finding ways both to cut down the blackout period caused by the electromagnetic pulse and to handle and process data in the field to provide experimenters with good quality data plots within a few hours of test completion."

In addition, 1100 designs and fields arming and firing hardware for LASL and LLL test devices. In other test work, seismic yields are measured and ground motion studies are made at NTS to assure safety both on and off site.

Above ground tests are non-nuclear. Those at Tonopah Test Range include flight and trajectory studies, gun projectile and missile firings, hard- and soft-target airdrops of weapon systems and high-altitude rocket and reentry-body studies. The Mobile and Remote Range Division supports weapon development tests at locations all over the world, including White Sands; Vandenberg, Edwards and Eglin Air Force Bases; Cape Canaveral, Wendover, Utah — and, closer to home, drop tests at the Edgewood test site in the Estancia Valley.

For coal gasification and oil shale projects, 1100 people measure temperatures, pressures, acoustic signals, ground resistivity and obtain gas samples for analysis. These projects devolve from the DOE's Laramie Energy Research Center in Hanna, Wyoming. A new oil shale project scheduled to get underway this summer near Vernal, Utah, is a joint DOE/industrial program with Geokinetics, Inc.

For WIPP, 1100 is running tests in the laboratory, studying the effect of heat on brine migration and getting ready to field in situ experiments in a potash mine near Carlsbad to study pressure, strain, collapse and related subjects in the walls of tunnels in salt beds. In support of the waste program at NTS, 1100 is running a heater experiment in the Eleana Shale Formation in the volcanic tuff in G-tunnel in Rainier Mesa. Future plans include establishing an in-situ rock mechanics lab in G-tunnel in support of waste disposal projects.



NOT ALL OF FIELD ENGINEERING DIRECTORATE 1100'S WORK is in the field. They also do laboratory experiments in support of programs like waste management. In this setup, the effect of heat on brine migration in salt is studied. Project leader Jacque Hohlfelder (1112) is at rear next to tank that contains a large, solid block of salt. Ray Villegas (1112) and Jim Johnson, center (1125) fabricated and installed various portions of the experiment. Follow-on tests are planned in a potash mine near Carlsbad.

Women and Social Security

What does social security coverage mean to a woman? Many misconceptions exist and we'll try here to dispel some of them. Our source is *Your Social Security* available from any social security office.

When social security was enacted in 1935, the program was slanted towards man as the wage earner and woman as the dependent. Changes in our society, particularly during the past 10 years, have largely eliminated the masculine tilt of SS, and it is now administered without reference to gender.

* * *

The Working Woman

A woman who works in a job or profession earns social security protection for herself as well as for her family. Social security credits earned by a single woman count toward monthly benefits for the family she may have in the future. For a working woman, this protection includes disability and survivors insurance.

As a working woman, you may retire at age 62 and draw reduced SS benefits, or you may retire at 65 to get full SS retirement benefits. If you're married, you can take retirement benefits based either on your own or your husband's record, whichever is larger. At 65, a wife is entitled to 50 percent of that

which her husband is entitled to at age 65. But, if you've worked most of your adult life, it's likely that your own benefit will be higher than a wife's benefit. The higher amount will be determined when you apply for retirement benefits.

As a working wife who has earned her own credits, you can retire on your record even if your husband continues to work past age 65 and earns too much to qualify for benefits. Or, if your husband is younger than you are, you can retire on your record, and when he retires, you can take the wife's payment if it is higher.

If you are entitled to social security benefits, either on your own or your husband's record, you will have Medicare hospital insurance protection automatically at age 65. If you don't meet either of these requirements, you'll need some credit for work under social security to get hospital insurance without paying a monthly premium.

The Housewife

If you are a housewife, you and your children have social security coverage through your husband's work and are eligible for benefits when he retires, becomes disabled, or dies.

When your husband becomes disabled or retires, you can receive benefit payments, regardless of your age, if you are caring for a child under 18 or for a disabled child who is entitled to benefits. If you don't have a child in your care, you must be 62 or older. Retirement benefits at age 62 are reduced, but if you wait until you are 65 you'll get the full wife's benefit — 50 percent of the amount your husband is entitled to at 65.

Widow's Benefit

When you are caring for a child who is under 18, or disabled and entitled to benefits, you can receive a widow's benefit at any age. Your benefits stop when you no longer meet those conditions. Your husband's work record also provides survivors benefits for unmarried

children under age 22 who are full-time students. If you do not have dependent children when your husband dies, you can receive widow's benefits if you are 60 or older. The amount of your monthly payment will depend on your age and the amount your deceased husband would have been entitled to or was receiving when he died. These benefits range from 71-1/2 percent of the deceased husband's benefit, when you are 60, to 100 percent at age 65. So, if you start getting benefits at age 65, you'll get the same amount your husband would have received were he still alive.

Benefits to a widow (or widower) who remarries at age 60 or older may continue without any reduction in the amount. If your new husband gets social security checks, however, you can take a wife's benefit on his record if it would be larger than your widow's payment.

Divorcee Benefits

You are eligible for benefits when your ex-husband starts collecting retirement or disability payments if you are 62 or older and were married to him at least 10 years. You may also receive payments if your ex-husband dies, provided you are 60 or older (50, if you're disabled) and you were married 10 years or more, or if you have young children entitled to benefits on his record.

* * *

Remember to make sure your social security record shows your correct name. Whenever you change the name you use in employment you should report the change to social security. Otherwise, your earnings won't be properly recorded and you may not receive all the social security credit due you.

The above highlights some of the provisions of interest to women and is not a complete explanation of social security. If you want more information, ask for a copy of *Your Social Security* at the social security office (tel. 766-2531).

Sandians Eager For New Learning

In 20 separate Labs-sponsored education programs, Sandians by the thousands are pursuing self development and new knowledge. In a report — "Education and Training Programs 1977-78" — issued recently by the Education Committee, the programs are described and summarized. Some 5300 Sandians were enrolled in one or more programs during the 1977-78 academic year.

The education effort with the most impact at the Labs is the In-Hours Technical Courses — INTEC — program keyed to maintaining and upgrading technical vitality. Some 690 Sandians completed courses under this program. These courses include the nuclear science and technology series, a quartet of courses devoted to nuclear physics, weapon and energy technologies.

Largest enrollment is in the out-of-hours program where 3126 employees took courses ranging from vocabulary building to principles of logic design during lunch periods or after work. This program also includes Sandia's formal Technical Institute Equivalency Program whose graduates are recognized as having earned the equivalent of a TI certificate. University and vocational level courses are included in the program. All instructors are Sandia employees.

Also included in the report are figures for participation in the Educational Aid Program (411 currently enrolled), One Year on Campus (10 participating) and the Doctoral Study Program (seven currently enrolled).

Other educational programs and participation include the Stanford University instruction television courses (31), university part time program (4), self study courses (295), ESA trainee program (13), apprentice program (40), MAS/MLS trainee program (17), work/study program (37), management and staff training (414) and adjunct and sponsored professors (30).



PHOTOGRAPHS by Tom Zudick (3155) and Wayne Gravning (3153) were included in the recent publication of Van Deren Coke's "Photography in New Mexico — From the Daguerreotype to the Present" by the University of New Mexico Press. Tom's series on artists in New Mexico was mentioned along with Wayne's portrayal of New Mexico landscapes.



CREAMPUFFS all, but no PB, AC, PS, AT, or AM-FM. Just eight medium tanks sent to Sandia, specifically to Dave Bickel of Track & Cables Division

1535, for some ordnance tests that Dave will conduct in Coyote Canyon. Each tank weighs 55 tons, was unloaded by tandem cranes (in background).

Credit Union Reporter

The Supervisory Committee of The Credit Union

The federal examiners' words stated that we were "running a first-rate Credit Union," and much of the credit for this appraisal derives from the work of our Supervisory Committee.

Appointed by the Board of Directors, supervisory committees for credit unions are charged by federal law with the "responsibility to review and evaluate the performance of elected officials and employees" of those credit unions. Committee members are free from arbitrary dismissal (like a federal judge) and share the committee authority to suspend credit union officials and employees for cause.

Perhaps its principal function is one of auditing and, to this end, the Supervisory Committee engages a paid staff that is trained and familiar with Credit Union finances. Records of deposit and loan transactions are examined for correctness and adherence to Credit Union policies, and internal procedures are similarly examined to assure protection of members' money.

For each Credit Union member, the Supervisory Committee is best known through its periodic request that you verify the statement of your account. This confirmation program is one of the best ways to assure that all is well within the Credit Union.

Members are urged to make use of the Supervisory Committee in its role of ombudsman. Here is the Committee roster: Fred Martinez (Chairman, 3212), Al Chavez (5000), Ed Haskin (3223), Paul Rosenkoetter (2632), and Dan Held (8213).

feed **lib**back

Q. Under current rules on extended book loans, I now must send the book back to the library every month for renewal even if no one else needs it. Why?

A. The intent of the Library's book circulation policy is to make available the greatest number of books to as great a number of users as our limited resources allow. This situation requires that we exercise some measure of consistent control over book location. Based on experience, our insistence on monthly renewals recognizes that even the best-intentioned borrowers lose track of books as time passes and that they need the reminder.

Even with the present control system, a recent inventory of the collection revealed 2,300 missing items. At an average replacement cost of \$20 a volume, we were not in a position to replace more than a very small percentage. Without a monthly check, we believe the number of missing books would increase significantly.

When a borrower needs a book for an extended period of time (i.e., 6 months) it appears that such use is similar to that given a handbook or other desk reference tool; for such use it seems reasonable that the user would buy his own copy. If the book is extremely expensive or out-of-print, we agree that a loan arrangement is more practical. In cases of unusual need you are welcome to contact George Dalphin, supervisor of the Reference Division, on 4-6028 for a review of the ways in which the Library can help you.

K.A. Smith - 3100

Q. When employees nominate themselves for lateral transfers in the Self Nomination Procedure in the weekly bulletin, are such nominations confidential and not disclosed to the employee's present organization?

Deaths



Harold Gustafson, an engineer in Transportation Division 1713, died suddenly while at work on April 19. He was 55.

Harold had worked at Sandia since 1951.

He is survived by his wife, two sons and a daughter.



Parker Jones, supervisor of System Studies Division 1231, died April 25 after a long illness. He was 56.

He had worked at the Labs since May 1953.

Survivors include his widow and four daughters.



Vic Engel of Management Staff 400 died on April 28 after a long illness. He was 58.

Vic had worked at Sandia since March 1952.

He is survived by his wife Polle.

A. Under the rules on self-nomination, it is the responsibility of the employee bidding for a position to notify his present supervisor.

The Personnel Representatives encourage selecting supervisors to first notify the candidates before contacting their present supervisor.

J.R. Garcia - 3500

Down Under Visitor Keeps Up With The Wind

Vic Chasteau came all the way from New Zealand just to watch the wind blow. (Or more precisely, to study its effects on Sandia's vertical axis wind turbine.)

In mid-May, when he finishes here, he'll be going to England, Holland and the Scandinavian countries to study other approaches to using the power of the wind and to South Africa for a closer look at their methods of converting coal to oil.

Vic's on a six-month refresher leave (a sabbatical) from the University of Auckland where's he's a Senior Lecturer (Associate Professor) in the School of Engineering. He was trained as a mechanical engineer at the University of Witwatersrand in Johannesburg, South Africa. Born in the Transvaal, Vic and his Holland-born wife, Marion, and their four daughters emigrated to New Zealand five years ago. One of Vic's first assignments at the University of Auckland was to a team studying the possible use of wind power to generate electricity for the national power grid.

"At that time, Canada, the U.S. and New Zealand all had major efforts in this area," Vic told us. As part of the project, Vic's team actually built a small vertical axis wind turbine and tied it into the power grid.

"It only produces about 5kw," Vic says, "a real drop in the bucket. But it more than paid for itself in knowledge."

According to Vic, New Zealand's interest in wind power surged during the energy crunch of 1974, just as it did in other nations around the world where the oils are low and the winds blow.

"New Zealand's in the wind belt," Vic explains. "It's a long, narrow country lying north and south. You're never more than 60 miles from the ocean and the winds blow east to west or west to east with great regularity."

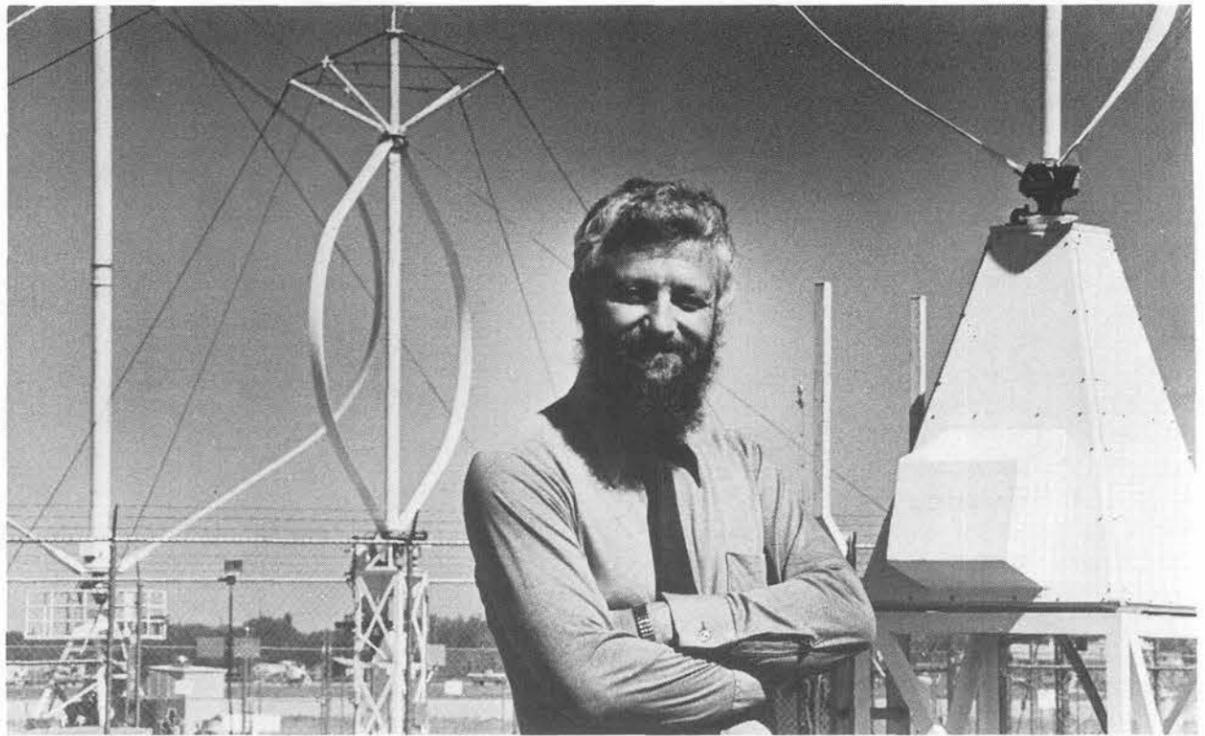
Despite the possibilities for using wind power in New Zealand, interest in the technique is less now than it was five years ago. After the crunch of '74, the government took a hard look at New Zealand's power production capabilities and found the country blessed with abundance.

"We can meet 80 percent of our power needs with hydroelectricity," says Vic, "and we're self-sufficient in coal and natural gas. Then there's our geothermal capability — we produce about 10 percent of our electrical energy that way. At the moment, our interest in large scale wind power is rather academic."

Vic has been working directly with staff people in Dick Braasch's Advanced Energy Projects Division 4715, and his search has focused on "blade flutter," the perturbation of the long, arced blades of the vertical turbine. He has worked chiefly with Sandia's two-metre vertical axis wind turbine, the smallest of Sandia's three turbines.

"We've already shown that flutter is a function of blade material and the rotational stiffness of the central column," Vic says. "We hope to be able to define the mechanism well enough that violent perturbation can be eliminated or controlled when we design and build even larger machines."

While Vic has watched the wind, his wife, an accomplished jeweler, checked in with the jewelry department at UNM and his four daughters have been attending Albuquerque Public Schools. Before they leave for Europe, they plan to extend their travel in the Southwest beyond the local area — to Carlsbad Caverns, El Paso, the Grand Canyon, Durango and Taos. In England,



NEW ZEALANDER VIC CHASTEAU, A Senior Lecturer in the School of Engineering at the University of Auckland, is finishing up a three-month study at Sandia of "blade flutter" on the vertical axis wind turbine. On a six-month sabbatical from the University, Vic moves on in mid-May to England, Holland, the Scandinavian countries and South Africa where he will study wind power projects and processes for producing liquid fuel from sources such as coal.

Holland and Scandinavia, where wind power has been widely used for centuries, Vic will visit a number of facilities, but South Africa holds even greater interest for him.

"I want to do some research there on wind loading of structures during thunderstorms," he says, "and I have an

interest in their program for converting coal to oil — and whatever other techniques they're developing to meet their liquid fuel needs. Since New Zealand has very little liquid fuel, such studies are of more than passing interest to us."

• cec

Fit is Better

For the Tired, Beginning & Hot Runner

A friend called. "I'm tired. I ran in that 10 kilometre thing yesterday, and now I can't decide whether to run home after work as I usually do. What do you think?"

I think the human body beats just about any other mechanism around, and one of its great design virtues is that it tells you when to lay off. Sometimes, of course, our go-go-go ethic gets in the way, we lapse into the override mode, and that's called toughing-it-out, a marvelous characteristic in times of war and great natural disasters, but rather irrelevant here. Observe the small child or a pet dog. They play, they get tired, they stop and rest or even sleep — simple, yes? It's only when we grow up that we learn to disregard instinct. In matters of exercise, be like that child. When you're tired, rest or at least cut back.

* * *

Another friend, not old, reported his medical scare: blood pressure 220 over 120. "Enough," according to his doctor "to rupture blood vessels in the eyeballs." Besides medication, the MD told him to get some exercise. His question to me: "How do I get started jogging?" At the time it struck me like asking "How does one scratch one's ear?" but upon reflection I realized that it may not be all that obvious. Herewith *Starting to Jog*: (1) Get an OK from your doctor. (2) Get a decent pair of running shoes, the kind that have lots of cushion underfoot and go for \$20 or more. (3) One fine spring morning get up early and start walking, sort of fast, for a mile or so. (4) After a week or two of this, jog for a bit, then

walk again. Jog only until you begin to experience mild discomfort, then walk. (5) Forget about time vs distance — the only important number for you is your pulse rate. Ultimately you'll be aiming at a rate that is 75% of maximum. (Maximum, roughly, is 220 minus your age). (6) Perform this routine four or five times a week, aiming for workouts of 20 to 30 minutes, or more if you're so inclined. (7) If you develop aches and pains, then (a) slow down, (b) cut back or (c) lay off entirely for a few days in that order (but don't kid yourself!) (8) Control your weight by sensible dieting.

* * *

Summer is coming and with it hot weather running. In case you hadn't noticed, running in 90° is different from running in 50°. If you insist on maintaining your accustomed pace, you'll work harder and your pulse rate will reflect the greater effort. So consider slowing down somewhat as well as reducing your mileage. You do acclimate, of course, but there's no way for your body to be as efficient at, say 95° as it is when temperatures are cool. In the matter of clothing, try a hat; if it's one of those floppy cotton hats with a crown you can wet down, so much the better. Then you'll run along with your own personal evaporative cooler. And drink more water, especially before your workout. Most runners will lose two to three pounds per hour on a hot day, and the loss is virtually all fluid. About tans: they look great, but the sun is hard on skin, especially at our high elevation — don't overdo it.

• js

Take Note

Americans for Rational Energy Alternatives is sponsoring a Nuclear Energy Fair at the Civic Plaza on Saturday, May 12, from 2 to 4 p.m. Theme of the fair is education on the benefits of nuclear energy and discussion of its risks. Exhibits will illustrate aspects of uranium mining and milling, nuclear power plants, the Three Mile Island accident, and nuclear waste disposal. Hot air balloon rides, refreshments, raffles, toy balloons and other entertainment are planned as well.

Ideas in Science & Engineering '79 is the title of an electronics show to be held at the Convention Center on May 10 and 11, with exhibits by some 180 manufacturers. In addition, ISE is offering two days of half hour seminars covering eight themes: medical electronics, energy technology (solar & geothermal), energy technology (nuclear, fusion, superconductivity), communications (fiberoptics, satellite, CATV), computer futures, electronic instrumentation trends, semiconductor technology and education/environmental concerns. It's two bucks at the door, or you can register in advance for a dollar. LAB NEWS has registration forms. Shuttle bus service is being provided by ISE from Bldg. 800 and the C-Club for Sandians who wish to attend (and have permission to do so).

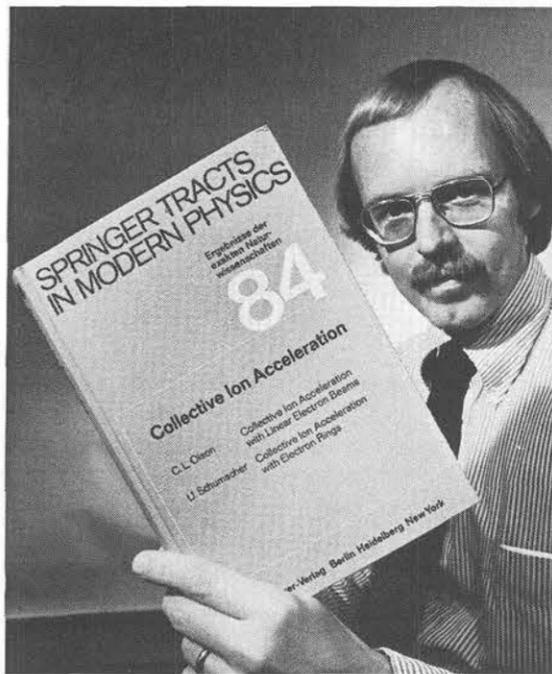
Sandia is well represented in the 29th Electronic Components Conference set for May 14-16 in Cherry Hill, N.J. Charles Tapp (8460) is Conference General Chairman, George Donaldson (2154) is Asst. Program Chairman, and Harry Olson (2145) is serving on the Reliability Subcommittee. Giving papers during the meetings are John Brainard and Larry Andrews (both 2154), Jim Jellison (5833), and Bruce Draper and David Palmer (both 2151).

Two free concerts are being offered in the next week by the First United Presbyterian Church's Music Department. On May 7 at 7:30 p.m. organist Charles Harris will play a number of classical and contemporary selections and, on May 12 at 8 p.m., "Variations" will be presented — "an evening of classical and contemporary choral and orchestral music." The church is located at 215 Locust NE.

Another concert is coming up on Mother's Day, with the New Mexico Symphony again performing its annual Rio Grande Zoo Concert. It's set for Sunday, May 13, at 2 p.m. in the zoo, and the menu includes nothing heavy, e.g. "Tubby the Tuba" and excerpts from Grofe's Grand Canyon Suite. Bring a picnic lunch and you'd better plan on getting there early — last year 8000 showed up.

And, if you go for cactus (cactuses?), you'll want to stop by the New Mexico Cactus & Succulent Society's annual show and sale tomorrow (1:30 to 5) and Sunday, May 6, (10 to 5) at the Albuquerque Garden Center, 10120 Lomas NE (Los Altos Park). Admission is 50¢. An auction of rare and beautiful plants will be held on Sunday between 1 and 2 p.m.

Albuquerque's Water Department, whose recent bills appear to have been prepared by a cartel of Arab sheiks, now wants to lower peak loads during the summer and is urging residents to water on even or



FIRST BOOK of physicist Craig Olson of Plasma Theory Division 4241 has just been published. *Collective Ion Acceleration* is really two books in one, the other half having been prepared by German scientist Uwe Schumacher. Publisher is Springer-Verlag of Berlin, Heidelberg and New York.

odd-numbered days according to your house number. The department's release also declares that most people over-water lawns and gardens, so they are publishing and distributing a watering guide. It doesn't say, but we assume you'll be getting the guide with your water bill. Of course, you can always cut way back by drinking your whiskey neat, or by showering with a friend.

The First Unitarian Church at 3701 Carlisle NE is sponsor of a series of singles get-togethers on Friday evenings, with music, dancing, a speaker, and other activities. Here are coming programs and the topics of the speakers: May 4, "Anger — Yours, Mine, Ours"; May 11, "Making Relationships Fun Again"; May 18, "The New Sexuality"; and May 25, "Relating Through Movement." Programs start at 7:30 p.m.

Former members and friends of the Women's Army Corps will meet for lunch at the Four Seasons Motor Inn on May 12 to celebrate the 37th anniversary of the Corps' organization. For reservations call Marian Jacot (3433), 299-4990.

Two Sandians, Mike Silva (3614) and Luther Otero (1543), were recently elected vice commanders of American Legion Post 13. Mike has been active with the organization since 1950 and is serving his fourth term as vice commander. Luther is currently sgt.-at-arms and has been active on various service committees with the Legion for the past 15 years.

Two Sandians have been elected to office in the Rio Grande Chapter of the Association for Computing Machinery (ACM). Ron Halbgewachs (2641) was elected President and Peter Watterberg (2644) Secretary, both for two-year terms. About 100 Sandians belong to the Rio Grande Chapter which meets three times a year for one and two-day sessions on mathematical computing, computer operating systems or business data processing.

Sympathy

To Allen Hall (1485) on the death of his mother-in-law, April 2.

To Dorene Yepa (1472) on the death of her mother-in-law at Jemez Pueblo, April 15.

Fun & Games

Coming up — The Duke City Dashers are sponsors of an AAU track meet to be held at Wilson Stadium on Sunday, May 13, with a multitude of events, e.g. 80 metre hurdles, 1500 metre run, mothers relay, mile relay, high jump, javelin and many more — even a baseball throw. Dave Douglass (5831) is a Sandia contact if you'd like to take part. Masters and sub-masters age categories are planned.

Also this month is the American Heart Association's National Run For Life, a run of no fixed distance save that which you choose to cover. It's set for Sunday, May 19, and for your \$3 you get a T-shirt and a book on running; you'll also be eligible for gift certificates and prizes. Entry forms are available in the LAB NEWS office in Bldg. 814.

Sailing — After our story a couple of issues back on sail boating via charter in the Caribbean, we had an interesting conversation with Sandia alumnus Harold Chaffee who, it turns out, is a participant in a sail boat chartering outfit located in, of all places, Albuquerque. Called La Vida Charters, they too operate out of the Virgin Islands (St. Thomas) and offer 36 and 42-foot boats. If you'd like to contact La Vida, you can reach them on 262-1494.

Unusual vacations — How about two weeks in the Gila Wilderness under the tutelage of an experienced woodsman? *New Mexico Excursions*, says the brochure, will "develop necessary wilderness skills and give students practical experience in group living outdoors." Most such enterprises are aimed at adolescents, but this one is for adults or, at least, those who are 16 or more years of age. Cost is \$475 and the outfit furnishes just about everything. For more information, contact The Rev. William Crews, St. Thomas of Canterbury Chapel, on 425 Univ. NE here in Albuquerque.

The Boston — At mile 10 Al Spencer (3611) realized that all wasn't going too well — he was tired. But, a touch of flu notwithstanding, you don't drop out of the Boston Marathon after you've made the not inconsiderable effort to get there (not to mention the airfare from Albuquerque to Boston and back). So he hung in there and, around mile 20, alternated walking and running and came in with a creditable 3:14. One of 10,000 or so participants, Al says it took him about a minute to get across the start line, though he talked with another New Mexican who only made the start line after six minutes.



MILEPOSTS
LAB NEWS
MAY 1979



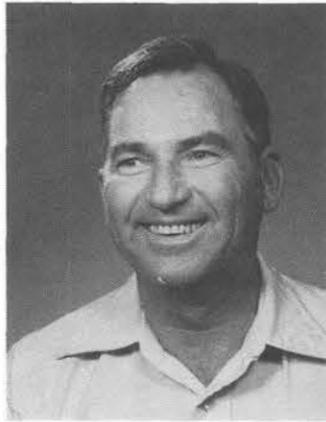
Glenn Loeppke-4722 20



Audrey Burns-3417 20



Jim Day-3332 15



Francis MacDonald-1135 25



Roger Eaton-5511 15



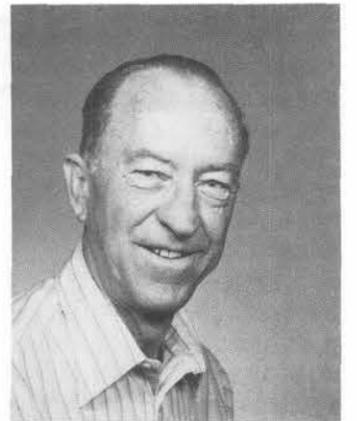
Mike Ford-5522 15



Albino Bustamante-5623 20



Howard Romme-3243 20



Charles Sullivan-4216 25



Earl Minor-4551 25



Bertha Williams-3721 15



Von Madsen-8444 20



Lee Davies-8250 30



Bob Trudo-2634 15



Jack Walker-4420 15



Doris Ramel-3321

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Carol Verity-8212

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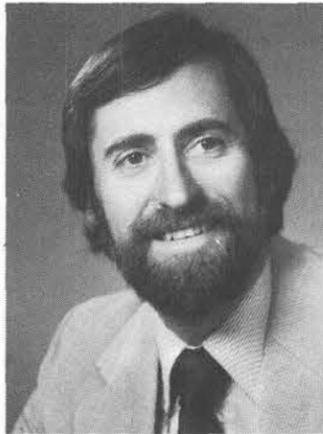
Rosie Jennings-2451

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Ben Conklin-4251

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Bob Green-8353

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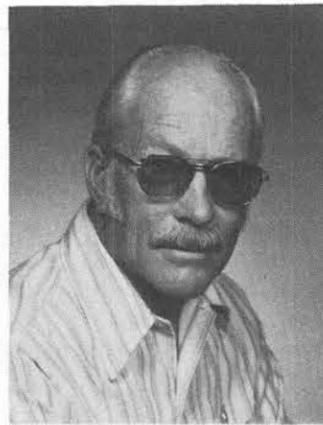
Richard Vigil-1583

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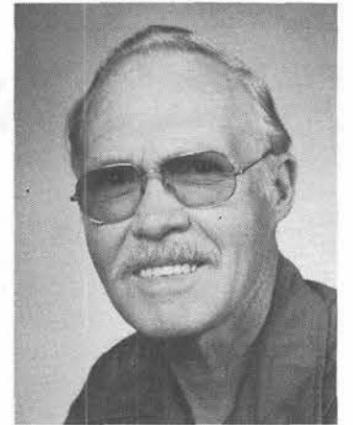
Dora Friedman-3172

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Bruce Langford-1474

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Morris Mote-8312

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Arnie Andrade-8424

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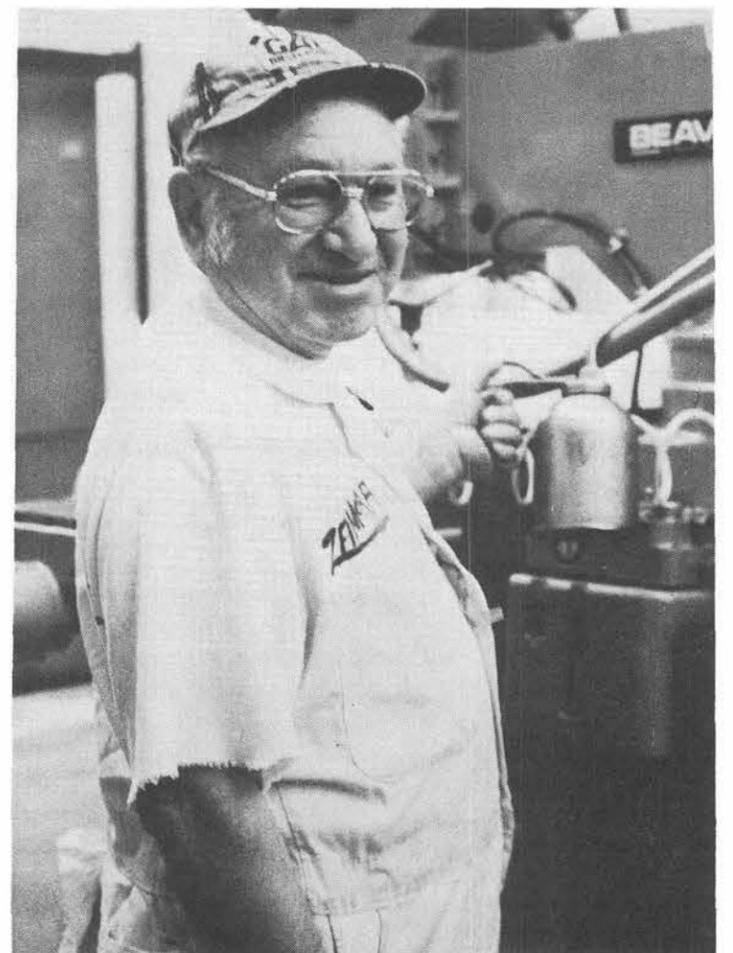
Earle Chapman-1759

20



Al Smailer-3615

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Frank Zamora-1485

15



Marie Carlson-2457

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Jacque Hohofelder-1112

10

Retiring



Jim Stueber (1585)



Fred Gregory (1482)



Lloyd Williams (1485)



Ray Brown (3653)

JUNK • GOODIES • TRASH • ANTIQUES • KLUNKERS • CREAM PUFFS • HOUSES • HOVELS • LOST • FOUND • WANTED • & THINGS

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (814/6).

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. Include name and organization.
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

INSULATED camper shell, slide in, \$350; RCA video recorder, 1 yr. old, \$650; bench & weights, \$50. Williams, 293-1438.

BELL & HOWELL 8mm movie camera & projector, \$200; Bundy clarinet, \$125; Sears Kenmore port. washer, \$40; Jensen stereo speakers, 90 watts/ch, \$200. Corradini, 266-4307.

COMPLETE service manual for '79 Dodge Ramcharger, Plymouth Trail Duster, D-100 - D-400 trucks, \$18 new. Fowler, 883-0107 after 6.

AUTO service manual for '76 MG-B, cost \$16, make offer. Thalhammer, 298-8521.

KING SIZE mattress & foundation, \$275. Shew, 299-8045.

12-TON hydraulic jack, \$30; tonneau covers for Triumph Spitfire (2 sets), \$40 each. Jones, 268-5236 after 5.

ANTIQUA cherry chest, 3-dwr., carved, w/mirror, orig. brass hardware, \$150; small blue upholstered chair, \$35. Shepherd, 299-9066.

THREE LR78-15 radial tires, \$20 ea. or all 3 for \$50. Pope, 255-6702.

WASHER & gas dryer, both for \$50; free cat to good home, 1 yr. old. Gunckel, 293-1371.

TAPPAN wall hanging oven/broiler, avocado green, gas, 22"W, 42"H, 19"D, \$75. Hursh, 842-6498 after 4.

FREE to good homes: 2 young male Samoyed-Australian Shepard cross dogs, loveable, good w/children, need yard. Banach, 831-1259.

ARGUS MODEL 300 slide projector, including 15 Airequipt magazines & new lamp, \$40. Muchow, 299-1813.

LAZY BOY swivel lounge, avocado green naugahyde arms & base, upholstered seat & back, \$150. Kerns, 821-4122.

CONN cornet w/case, \$100. Waite, 867-5953.

BALDWIN Orga-Sonic concert organ w/Leslie speaker, solid walnut cabinet & bench, asking \$750, consider offer. Lyon, 299-9423 or 884-8515.

GR 70-15 steel belted radials, 2 ea., 1 General, 1 Uniroyal, new both mounted on 5-hole steel rims, both for \$55. Prokash, 296-6775.

FRENCH HORN, Holton Farkas double, nickel plated, case, accessories, \$800. Kerr, 299-7527.

SCIENTIFIC CALCULATORS, APF Mark 50, \$10; TI-30 w/charger, APF girl's 20" hi-rise bicycle, \$20. Hale, 298-1545.

SOFA, Stratford Early American sectional, brown, \$225. Trump, 299-5162.

KEYSTONE custom wheels for Chevy, 15x7, 4 wheels, \$120. Bisbee, 293-0356.

YARD SALE: misc. junk & stuff, some good, May 18, 19 & 20. Warrick, 1111 Major NW, 344-5057.

PARTS: 4-cyl. Opel Kadett, 1969, std. trans., engine, brakes, front & rear end, make offer. Voigt, 881-6037 or 898-2537.

10-80 METER ANTENNA, 18 AVT. Schwoebel, 298-4295.

COUCH, blue floral, \$250; 2 round, green velvet chairs, \$80 ea.; glass cocktail table, \$40. Kratz, 884-8122.

POLAROID CAMERA w/many acc., \$35; Tomasville dining table, 6 chairs, solid pecan, \$600 or best offer. Bailey, 268-9583.

WOODEN SCREEN DOOR, 36"x80", \$10 look-like wrought iron screen door, 36x80; 2 avocado green chairs. Ball, 255-8453.

HICKEY SIDEWINDER winch, 8000 lb. pull w/mounting kit for GMC, Chevy or Blazer, \$500. White, 877-4149.

FURS: natural grey Persian lamb coat; natural pastel mink stole; dyed Asiatic mink stole, best offer. Suazo, 265-3291 after 7.

SEARS sickle bar mower, \$350. Bontrager, 281-3427, after 6.

REFRIGERATOR, about 14 cu. ft., not frost-free, \$50; washer/dryer combo., 3 yrs. old, Frigidaire, 220V, \$250. Damrau, 881-4576.

GARAGE SALE: clothes, toys, household goods, 5/5/79 9 to 5; 5/16/79 12 to 5, 3325 Britt St. NE. Moulton, 293-0373.

COUCH & LOVESEAT, gold, \$200; coffee table, \$50; end table, \$25; table lamp, \$25; swag lamp, \$15. Harris, 821-8524.

CARPET, greenish w/pad, 14x16', \$95; bumper pool table w/reversible top for card playing, \$175. Norwood, 292-0072.

TENT, canvas 9x12 w/floor, outside mounting pole frame, screened windows & door w/rain flaps, \$75. Oravec, 281-3667.

NORGE refrig/freezer, frost-free, 5 yrs. old, 21.3 cu. ft., 312-lb. freezer capacity, copper tone, \$300. Padilla, 899-3115 after 5.

SHETLAND SHEEPDOG puppies (miniature Collies), sable & white, 2 males, 3 females, AKC reg., 8 wks., shots, \$125/\$150. Anthes, 293-0926.

TIME SWITCHES (Dayton) for hydro-ponic setup, 24-hr, 5 to 60-min. on-off capability, set of two: \$30. Leenhouts, 299-7856.

SOFA, 96" Danish modern, \$150; pole lamp, \$15; lawn mower, 18" reel, \$45; elec. trimmer, \$20. Buss, 298-1589.

SCANNING MONITOR, programmable, 16-channel, 5 bands, no crystals needed, 30 to 510 MHz, AC, or DC, \$185. Erni, 268-1721.

MAJESTIC CORONET w/case, \$75; Super-Brute ping pong table, \$60; snare drum w/stand & case, \$35. Guth, 821-4704.

CAMPING TRAILER, 15', ice box, stove, oven, sink, sleeps 8, best reasonable offer. Clark, 884-8266.

VOLKSWAGEN PARTS: 4 chrome & 4 hole wheels, 6 tires, \$100; new Treuhait headers, muffler, \$50; oil

cooler kit, \$40. Stephenson, 299-3914.

LUGGAGE RACK, alum. frame w/oak runners; gasoline engines, 3 HP to 5 HP, cast iron blocks; Harvard bed frame. Barber, 299-4287.

WEIMARANER, free to good home, 5 yrs. old, spayed female w/papers, good family watch dog. MacLeod, 293-6395.

RIDING MOWER, 26" cut, single blade rotary, 5 HP B&S engine, 18 mos. old. Allison, 865-5933.

REFRIGERATOR, 17 cu. ft.; over-stuffed chair & ottoman; room air conditioner & several misc. items; stereo. Graham, 293-7302.

TRAVEL TRAILER, 13', ice box, stove, toilet, \$975. Mares, 299-6958.

BACKPACKS, child's size, \$18; small adult size, \$30; Drumheller, 821-9527.

ELEC. WATER HEATER, 80-gal, 2 yrs. old, \$75; Reed and Barton sterling, Tara pattern. Prew, 296-3815.

TRANSPORTATION

BOAT, aluminum, 14', cartop, accommodates 18HP outboard, \$295; tent, 9x12 center-pole type, \$20. Hueter, 242-1620.

16' CHRYSLER bass boat w/40HP Evinrude motor. Houghton, 1413 Guaymas NE, 299-3386.

'72 FORD F-100, AC, PS, PB, new shocks & brakes. Casans, 867-5785.

'73 FORD LTD, AC, PS, PB, AM-FM-8T, \$1900, orig. owner. Samuelson, 821-5243.

'72 blazer 4x4, std. trans., V8 engine, \$1650. Miller, Box 823 Cedar Crest, NM. 87008.

'72 VOLVO P1800E, 60,000 miles, AT, AM-FM stereo, orig. owner. Baca, 298-4521.

'77 DODGE Tuffy mini-motor home, 318 engine, 13,000 miles, completely equipped, take over \$179/mo. payments. Keepports, 266-0217 or 881-8066 after 5.

'70 MGB, \$1100. Banach, 831-1259 after 5.

'76 PINTO, 17,000 miles, PS, PB, AT, vinyl roof, radials, \$75 below book \$2500. Hesch, 1-983-9382.

'70 OLDS 98, fully loaded, carb. overhauled recently, new engine parts. Denham, 292-3749.

'75 AMC Mododor 9-pass. str. wgn., R&H, AC, power rear window, terms, \$1900. Browne, 881-3772.

ZIP SLED for water ski beginners, \$25; chrome plated bracket for small outboard motor, \$20. Kerns, 821-4122.

'67 TOYOTA Corona 1900 4-dr. sedan, AT, R&H. Luna, 299-2488.

'63 CORVAIR, 4-dr., steel radial tires, orig. owner, AT, \$1500. Kerr, 299-7527.

'77 DODGE VAN, B-200, custom interior, dual gas tanks, Cruise Control, AC, PB, PS, sunroof, luggage rack, ladder, \$7000. Yaniv, 821-0999.

'73 VW BUS, 7-pass., white over beige, under book. Chacon, 292-1461.

'75 SUZUKI GT380, Vetter fairsing, Batus travel bag, 9000 miles, \$800 or trade for small camper. Koontz, 821-3910.

'69 FORD camper special, 3/4 ton, AC, PS, AT, w/10 1/2 ft. cab-over camper,

self contained, orig. owner, \$2800. Schneider, 299-6243.

'75 CAMERO, PS, WW, radio, below book at \$3295. Baca, 298-8586.

'68 PONTIAC GTO, orig. owner, PS, PB, factory air, auto. Giddings, 298-6221.

'72 THUNDERBIRD, white, 55,000 miles. Bass, 884-8491.

'75 DODGE Coronet Brougham, 2-dr., AT, AC, PB, PS, Cruise Control, AM-FM stereo, vinyl top, 41,000 miles, 1 owner, \$2500. Rogers, 298-7907.

'68 FORD pickup, LWB, many extras, \$950. Rarrick, 296-2340.

'72 TOYOTA Corona 4-dr., radio, AC, auto, 23 mpg in town, \$1000, NADA \$1375. Lowe, 299-7725.

'72 FIREBIRD w/T/A kit, new paint, AM-FM-tape, PS, std. trans., radials, \$2350. Canfield, 299-9628.

SUZUKI DS 185, dirt/street bike, \$595. Barnes, 299-4114.

'78 PONTIAC Sunbird, 8500 miles, still under warranty, \$3600. Gregory, 255-1592 after 6.

35 HP Sea King outboard engine, \$350; 14' runabout boat & trailer free w/engine. Anderson, 294-8624.

'69 2-dr. BUICK Skylark (intermediate), console shift, AC, AM-FM, price negotiable. Adams, 256-7265.

REAL ESTATE

2.1 ACRES, Peralta area, substantial down, rest on payments; irrigation tubes & Sears water pump. Abeyta, 298-4276.

2 ACRES 7 miles E of Moriarity, elec. avail, \$5000; model home on lg. corner lot, 1850 sq. ft., 3-bdr., many extras, 2 yrs. old, \$68,000. Hale, 294-0212.

FURNISHED mobile home, 24'x60' on 110'x200' lake front at Conchas, 3-bdr., 2 bath, wet bar, completely carpeted, 2 sheds, dock. Fosters, 821-1856.

24x44' MOBILE HOME, 2-bdr., 2 full baths, awning, set up in adult section of park. Riley, 293-3882.

LARGE LOT (about 2/5 acre) overlooking city, has utilities, near Tramway & Central, \$3500 down, \$23,000 contract. Chavez, 831-6470.

3'BDR., 1 1/2 baths, near base-school-bus lines-shopping, remodeled, redecorated, RV access, landscaped. Seibert, 268-9217.

4-BDR. BRICK HOME, 3 bath, lg. FR, fp, newly redecorated, close-in, assume low equity, 8 3/4% VA loan, \$64,900. Beyers, 265-4555.

WANTED

PITH HELMET; vehicle mount altimeter. Norris, 299-4717.

TELESCOPE for beginner, up to 60x w/finder scope & tripod. Bonahoom, 296-4450.

MAN OR COUPLE. Mountain summer camp custodian; provides 10x36 trailer, utilities, truck, some money; 1 hr. from Abq. Stixrud, 298-0478.

HOUSE for Univ. prof. summer hire, mid June through August, near base

is desirable. Perdreauxville, 296-2870.

FLAGSTONE: any amount up to 500 sq. ft., cheap or for the hauling. Marsh, 298-5795.

CARPOOLER from vicinity of 4th & Montano NW. Orr, 345-0631.

HOME for 2 small female dogs, spayed, 8 yrs. age, good health, all shots current. Binder, 299-2937.

SLIDE TRAYS for Kodak carousel, 80's or 140's. Caskey, 294-3218.

RIDE or share ride vicinity Armijo & Isleta SW, female, non-smoker. Karver, 873-0653.

SMALL (4000 BTU) refrigerated air conditioner. Hertel, 255-0329.

NEED outside, intermittent storage spot for mini-motorhome from June 1 to Aug. 15. Westman, 881-0471.

PEOPLE interested in forming a Van Pool from Moriarity, Edgewood area. Dungan, 281-3862.

ONE TO TWO HP electric air compressor. Falacy, 293-2517.

NEED reliable klunker, cheap. MacCallum, 268-1184.

FOR RENT

NEW 4-plex, 2-bdr., w/fp, upgraded throughout, from \$290. Thalhammer, 298-8521.

2-BDR. APT., private rear yard, dishwasher, major appliances furnished, off-st. parking. O'Bryan, 293-4621 after 5.

HOUSE IN NE (Eastridge), avail. 8/1/79-9/1/80, 3-bdr., 2 baths, trailer access, will consider renting partly furnished, \$375/mo., water included. Reif, 299-2665.

UNFURNISHED 3-bdr., 2 bath, appliances, completely redecorated, new carpet throughout, carport, storage shed, south valley, \$275/mo., \$250 DD. Tobyas, 877-0354.

NEW studio apts., 1320 Grand NE. Spray, 884-8453.

VALLECITO LAKE cabin near Durango, modern, 3-bdr., w/fp, fully furnished, avail. day/week, reservations. Croll, 881-7235.

UNFURNISHED 3-bdr. home, 10 mins. from base, see during weekend, 418 Mankin, \$300/m. Baca, 1-471-6122.

4-BDR., 1 1/2 baths, den-fp, dishwasher, disposal, refrig., elec. range, dbl. garage, no pets, \$475/mo. DD. Spencer, 296-6250.

ROOM MATE WANTED to share 3-bdr., NE hts. home, all privileges, must be neat, quiet & employed, \$135/mo. avail. 5-15. Luna, 298-3571.

NEW 3-bdr. house, near I-40 & Coors NW, dishwasher, disposal, AC, carpeted, drapes. Adams, 256-7265.

WORK WANTED

TEENAGER will do trash hauling \$8/per load. Randy, 881-3812.

LOST AND FOUND

LOST — Woman's tan cloth coat belt, man's rust-colored cardigan, earring w/3 silver balls.

FOUND — Large silver key. LOST AND FOUND, Bldg. 832, 264-1657.

Coronado Club Activities

Last Call for Cancun

TONIGHT at Happy Hour the fantastic trumpet of Freddie in front of the Mellotones will fill the ballroom with the kinds of sound that's rare these days — you can hear the melody and understand the words. It's dance time. Club manager Pat Corcoran matches the occasion by spreading strip loin of beef with mushroom sauce on the buffet table. Next Friday, a group called "Y-Sus Gatos" plays for dancing while lobster or prime rib tops the buffet. Call the Club office, 265-6791, by mid-week to reserve buffet tickets.

Also tonight, singles mingle in the Eldorado room starting at 4:30. Get insight into your personality through handwriting analysis by professional graphoanalyst Paul McManus. Also on the program — munchables, music and dancing.

TOMORROW the Sanado Ball starts at 6:30 with cocktails, then dinner and dancing with the Carter Express.

VARIETY NIGHT on Saturday, May 12, features a show with singing and dancing by the Highland Entertainers and a movie, "Lt. Robin Crusoe, USN," starring Dick Van Dyke. Super sandwiches are available at 6, the show starts at 7 followed by the movie. Bring the kids. Admission is free to members.

A FEW SEATS remain on the Cancun package leaving May 12 for the Caribbean resort on Mexico's Yucatan peninsula, close

FRIDAY	SATURDAY
4 — HAPPY HOUR Strip Loin of Beef with mushroom sauce Adults \$5.20 Under 12 2.60 MELLOTONES Single Mingle 4:30	5 — SANADO BALL 6:30 Cocktails 7:00 Dinner CARTER EXPRESS
11 — HAPPY HOUR Lobster Tail or Prime Rib Adults \$6.95 Under 12 3.50 Y-SUS GATOS	12 — VARIETY NIGHT "Lt. Robin Crusoe, USN" — movie Supper 6:00 The Highland Entertainers — 7

to the classic Mayan ruins of Chichin Itza. Spend seven nights at the Cancun Caribe or the Playa del Sol Condominium Inn. The package costs \$356.50 or \$416.50 depending on accommodations chosen. A Cancun pre-trip meeting is set May 8 in the main ballroom at 7:30 p.m. See Travel Director Ed Neidel in the Club lobby tonight for full details. Ed also has special packages for Hawaii, Europe and Las Vegas.

UPCOMING EVENTS — Western Hoedown with the Watermelon Mountain Jug Band, May 19; Swim season opening party, May 26.

Events Calendar

- May 5-6 — NM Cactus and Succulent Society annual show & sale: Albuquerque Garden Center, 10120 Lomas NE (Los Altos Park), Sat. 1:30-5 p.m., Sun. 10-5, admission 50¢.
- May 5-6 — Indoor/Outdoor Arts & Crafts Fiesta, La Galeria Del Norte, 9025 4th NW; includes workshops & demos in batik, raku, watercolor, candle making & woodcarving; 9-5 p.m., Info: 897-1988.
- May 7 — Concert, Albuquerque Philharmonic Orchestra, 8:15 p.m., UofA Fine Arts Learning Center, Stage II, free admission.
- May 7 — First United Presbyterian Church (215 Locust NE), free organ recital by Charles Harris of Dallas, Sanctuary, 7:30 p.m.; May 12 — free concert featuring Chancel Choir and guest soloists (Gene Ives, 4330), Sanctuary, 8 p.m.
- May 10 — Edgar Allen Poe, one man show of poetry & a dramatic interpretation of Poe's life, by local actor Adam Sanchez; Community Cultural Affairs Program, \$1.50 general, \$1 students, 8 p.m. KiMo Theater.
- May 12 — "Sweet Pearl, Such A Fate For That Girl, or There's No Place Like Nome," musical melodrama, Sweet Adelines, Inc., tickets \$3.50 at the door, 8 p.m. KiMo Theater.
- May 13 - July 15 — St. John's Cathedral Gallery: N.M. Watercolor Society 10th Anniversary member show, 318 Silver SW, M-F 9-4 p.m. & Sun. 8-1 p.m.
- May 14 — Maxwell Museum Ass'n., new exhibit of Navajo rugs and Pueblo pottery, mini-museum at 1st Plaza Galeria, 11:30-2 p.m.
- May 16 — Maxwell Museum of Anthropology Spring Lecture Series: "The Ancient Maya Traders of Cozumel, Mexico," 7:30 p.m., Presbyterian Professional Center, 201 Cedar SE.

Help Wanted: Bike Guides

Ron Malpas (1761), who is president of the Sandia Bicycle Association, agrees with us that many more Sandians might bike to work than currently do (about 300 on a good day), but they are somewhat intimidated by the traffic over what would be for them an uncertain route. From any point in the city to Sandia Labs, there are bad routes and good routes for bikers, and the person who probably knows best which is which is the veteran rider who has been over the course many times.

LAB NEWS receives calls from would-be riders asking about optimum routes, and we're frustrated in trying to answer these inquiries by our incomplete knowledge of good routes to the Labs throughout the city.

Can you help? We'd like to prepare a contact list which lists commuting bikers by their home's geographical zone. Then, when the would-be biker calls LAB NEWS, we'd send him or her a copy of the list. Ideally, after contact is made, the veteran biker would then meet the novice some morning and lead the way in.

If you're willing to be a bike guide, send us your name, home address, work and home phone number plus the nearest intersection to your home derived from these two columns of arterials:

North/South

- Academy
- Osuna
- Montgomery
- Comanche
- Candelaria
- Menaul
- Indian School
- Lomas
- Central
- Garfield
- Kathryn

West/East

- Broadway/Edith
- University
- Girard
- Carlisle
- San Mateo
- San Pedro
- Louisiana
- Pennsylvania
- Wyoming
- Moon
- Eubank
- Morris
- Juan Tabo
- Chelwood
- Tramway

Send it to Bike Guide, LAB NEWS.

ECP Committee Named

Gene Blake (1710) is chairman of this year's Employee Contribution Plan at Sandia Labs. ECP works with Albuquerque's United Way in raising funds for charitable and humanitarian purposes.

Other members of the Executive Committee of ECP include Jerry Hood (4360), Art Arenholz (3520), Calla Ann Pepmueller (3140), Larry Garrison (1000), and Willie Garcia (3163). Vice Presidential Representatives: for 1000, Gary West (1522); for 2000, Andy Oravec (2457); for 3000, Elveta Patrick (3211); for 4000, Robert Hogan (4542); and for 5000, Bill Warren (5531). Union Representatives: for IGUA, Gene Romero (3430); for MTC, Ray Sanchez (3421); and for OPEIU, Carl Hardley (3172). Bernice Sanders (3533) is New Hire Coordinator.

Sandians who have questions or suggestions about ECP are urged to contact their VP representative or any other member of the Committee.

Congratulations

Mr. and Mrs. Jerry Hochrein (5622), a son, James Michael, on April 8.

Feather your nest.



Take stock in America.
Buy U.S. Savings Bonds.